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ABSTRACT

While education systems from nation to nation differ significantly according to national character and local requirements, developments in public policy initiatives regarding the use of technology in schools have followed similar patterns among nations as diverse as the United States, Great Britain, Denmark, Italy, Viet Nam, Germany, France, Singapore, Japan, Mexico, and Brazil. This paper is based on participant observations in international meetings, collaborations, consultations, project planning, and negations, supported by key document reviews. It is postulated that the commonalities in such initiatives stem from the emergence of a global digital economy and society, and that education reform has taken on an unprecedented global character, regardless of initial status of an educational system, as a consequence. It is further postulated that the commonalities are the product of a reactive approach to educational reform, that rational decision-making has been inadequately applied to public policy and instructional decision-making, and that the issues not yet addressed promise to pose significant impediments to getting an adequate return on the broad investments in information and communications technology among the various nations. Appendices include a meetings and informants list and an overview of international grant sites for the IBM Reinventing Education Program. (Author/MES)

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# Commonalities in Educational Technology Policy Initiatives Among Nations

By: James Schnitz and Janet Azbell

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# Commonalities in Educational Technology Policy Initiatives Among Nations

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## Introduction

While education systems from nation to nation differ significantly according to national character and local requirements, developments in public policy initiatives regarding the use of Information and Communications Technology (ICT) in schools have followed similar patterns among nations and political units as diverse as the United States, the European Union, Great Britain, Denmark, Germany, Italy, Victoria, Australia, Singapore, Japan, Viet Nam, Mexico and Brazil. Specifically, initiatives for public investments in ICT tend to fall into common categories: investments in introducing computer workstations into schools accompanied by initial technology training for teachers are followed by investments in infrastructure and connectivity accompanied by further professional training in both ICT skills and integration of ICT in classroom instruction while attempting to define effective practices. The commonalities in such initiatives seem to stem from the emergence of a global digital economy and society rooted in the evolution of ICT since the birth of tl.e Web, which has produced a species of education reform that has taken on an unprecedented global character, regardless of performance of or local satisfaction with an educational system. Further, the commonalities appear to have evolved reactively to a combination of opportunity and pressure, with rational decision-making inadequately applied either to public policy or instructional decision-making. The result is the emergence of issues of effectiveness not yet addressed that must be resolved to enable nations, schools and communities to obtain an adequate return on their extensive investments in ICT.

## Methodology

This paper is an episodic rather than systematic analysis of international initiatives. It is based on two and a half years of participant observations in international meetings, collaborations, consultations, project planning and negotiations, supported by key document reviews that together form the picture that emerges below. The participant observations were not originally undertaken with the intent to do field research, but rather were consequences of work assignments for IBM's education business and Reinventing Education program that involved interacting with various ministries, education authorities, and community leaders as business opportunities emerged in regions around the world. It wasn't until about a year ago that a sufficiency of cases had accumulated that the possibility of codifying repeating occurrences became apparent. The result was an attempt to capture retrospectively both the essence and specifics of the cases *vis a vis* the hypothesis above: that emerging economic and social realities had driven common approaches to education reform that have been more reactive than rational.

Three kinds of cases formed the data sources for this paper. The first were business opportunities, which usually consisted of a briefing and discussion directed at determining the presence or absence of a possible sale of products and services. During such sessions, information about the state of technology presence and integration, and priorities for educational initiatives both with and without technology were routinely exchanged. Of the 100 documented meetings, activities

and projects that occurred from January 13, 1999, through June 12, 2001, that form the total source base,[1] 62 were of this type with numerous telephone and e-mail communications associated either with preparation or follow-up taking place as well. Examples include meetings with schools and school authorities such as:

- Haram-modellen, Norway,
- Aarhus, Denmark,
- Toulouse, France,
- Essex, England,
- Outram School, Singapore, and
- Mitaka City, Japan.

Additionally, a number of similar meetings were held at the senior civil service and ministerial level. Selected examples include meetings with:

- Estelle Morris, then Minister of Standards and now Education and Skills Secretary, U.K.,
- John Elvidge, Secretary and Head, Education Department, Scottish Executive,
- Pascal Colombani, Director of Technology, Ministry of Education, France,
- Paul Eschbach, Section Chief, Ministry for Schools and Further Training, Science and Research, North-Rhine Westphalia, Germany,
- Wee Heng Tin, Director-General of Education, Singapore, and
- Nicky Capponi, Manager, Centre for Technology Supported Learning, DEET, Victoria, Australia.

Finally, industry trade shows such as BETT, held in London each winter and attracting over 400 exhibiting companies and over 20,000 visitors from 76 countries,[2] offered concentrated opportunities to interact with a wide variety of both users and providers of technology in education.

The second case type were formal, invited addresses to international audiences. Examples include:

- the NAHT Conference, October, 1999,
- a Singapore Ministry of Education school administrators' plenary, September, 1999,
- the EUN Schoolnet Conference, March, 2000, and
- the Edinburgh Science Festival, April 2001.

While such sessions consisted primarily of the dissemination of the speaker's views regarding technology in schools, the inviting government or organization requested the topics. The sessions also offered invaluable feedback and confirmation on the appropriateness of those views to international venues.

The third case type were project planning negotiations surrounding opportunities for international Reinventing Education projects, philanthropic projects funded by IBM's International Foundation to generate solutions and solution models for the effective use of ICT in schools patterned after the Reinventing Education program sponsored by IBM in the U.S., and ongoing Reinventing Education projects.[3] Examples include:

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[1] APPENDIX A contains a complete list of all meetings and key informants. Note that some meetings were not finite in nature, and involved ongoing collaboration and/or multiple party participants such as during the BETT and TWL Trade Shows. Yet other meetings served more than one purpose.

[2] http://www.bettshow.com/bett/default.asp?SectionName=bett_About&Group=V

[3] APPENDIX B contains summaries of the eight active international Reinventing Education projects. Additional information about Reinventing Education can be found at http://www.ibm.com/ibm/ibmgives.

- The Singapore Ministry of Education, Instruction and Assessment Transformation Project
- Mitaka City, Japan, Period of Integrated Study Proposal
- Toulouse, France IUFM and Academie, ICT-based Improved Performance In ZEP Schools Proposal
- The U.K. Department for Education and Employment (now the Department for Education and Skills), Beacon Schools Dissemination Project

Because these cases require the identification of critical issues for school transformation and negotiation of agreements between governmental units and IBM, they have been highly revealing of the policy directions and priorities felt at both the governmental and operational levels of education in the participating regions.

The model for thinking about patterns of investment and policy stems from the Four Pillars of U.S. education technology policy objectives established in 1996 by the President and tracked since that time by the CEO Forum on Education and Technology.[4] The Pillars focused on Hardware, Connectivity, Content and Professional Development, and set a target for action by schools and education governing bodies. The challenges issued were:

- **Hardware**
  All teachers and students will have modern multi-media computers in their classrooms.
- **Connectivity**
  Every classroom will be connected to the information superhighway.
- **Content**
  Effective software and online learning resources can increase students' learning opportunities.
- **Professional Development**
  All teachers in the nation will have the training and support they need to help students learn using computers and the information superhighway.

The establishment of the Four Pillars as policy led to the creation of new programs and the application of funds from existing programs such as

- the Technology Literacy Challenge,
- Technology Innovation Challenge Grants,
- PT3 (Preparing Tomorrow's Teachers to Use Technology) Grants,
- Title I grants for basic and advanced skills, and
- E-rate discounts

that in 2000 supported technology initiatives in U.S. schools to the level of approximately $7 billion, $1.5 billion of which came from federal sources other than e-rate.[5] Given the financial and policy focus on educational technology implementation, the CEO Forum, a consortium of technology providers, digital content providers and education organizations, was established to track progress in these areas and study movements in practice such as the growth in professional development allocations from technology budgets from under 7% two years ago to a recommended 20% in the current version of the Senate education bill.[6] It was the CEO Forum's findings over the duration of its existence of clear movement in the Hardware, Connectivity and Professional Development Pillars coupled with less clarity in the Content Pillar and the strong need for research on what works expressed in its final, newly released report on Accountability,

[4] School Technology and Readiness Report: From Pillars to Progress, The CEO Forum on Education and Technology, October 9, 1997 pp 7-8
[5] The Power of the Internet for Learning: Moving from Promise to Practice, Report of the Web-Based Commission to the President and Congress of the United States, pp. 118-119
[6] http://www.ceoforum.org. All reports from the Ceo Forum can be downloaded from that site.

coupled with the hardware, connectivity and professional development focuses and increasing interest in demonstrated best practices that emerged from the 100 cases referenced above that suggested the possibility of a pattern of commonalities that evolves naturally in response to economic, social, institutional and political circumstances and pressures, and which might be reflected by any system experiencing those same circumstances and pressures.

## The Context—Fuel for the Global Digital Economy

The drive toward increased investment in ICT in various locations around the globe stems from a simple reality: the unprecedented growth of a global digital economy and society as the single largest fundamental transformation in the world's social and economic structure since the industrial revolution, with immediate and dramatic implications for education. Federal Reserve Board chief Alan Greenspan put the impact in perspective when he said,

> "What differentiates this period from other periods in our history is the extraordinary role played by information and communication technologies. The effect of these technologies could rival and arguably even surpass the impact the telegraph had prior to, and just after, the Civil War."[7]

John Glenn underscored the educational implications when he wrote in a report to the U.S. Department of Education, "Times have changed. In an integrated, global economy, whose key components are increasingly knit together in an interdependent system of relationships, will our children be able to compete?"[8] The same concerns caused the German government to establish an initiative called D21 in 1999 to

> "...boost competitiveness in Germany's economy, generate new markets, create new workplaces and reform and 'informatize' education..." to enable German youth to develop the skills necessary to be successful.[9]

According to Yeow Cheow Tong, Singapore's Minister for Communications and Information Technology, Singapore's

> ...aim is to equip infocomm workers with the right mix of business skills and up-to-date technical competencies so that they can succeed in the competitive global Internet economy... For students, the Ministry of Education's target is to have 30% of the school curriculum computer-based. This will pave the way for our students to be infocomm-savvy.[10]

The French government asserted the importance of ICT in January, 1998, in the Prime Minister's plan "Preparing France's Entry into the Information Society," with education the first of the six priorities established.[11] In Australia, the Department of Queensland Education has developed a

[7] "Fed chief: Tech is driving productivity," USA Today Online, http://www.usatoday.com/life/cyber/invest/in770.htm, June 13, 2000
[8] Before It's Too Late: A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century, Education Publications Center, USDOE, September, 2000, p 4
[9] http://d21.fujitsu-siemens.com/d21/english/d21_en.htm; Appendix A, #55, Paul Eschbach, 9/27/00
[10] "Strategies for Developing Manpower in the Sector," Yeo Cheow Tong, Speech to the Singapore Computer Society, March 4, 2000.
[11] APPENDIX A, #49, Pascal Colombani, 2/22/00

New Basics Plan intended to prepare students for the "new blend of skills and competencies" required by "new technologies, globalised economies and communications media...."[12]

Transformations in the global economy are here to stay, regardless of the recent slow-down in the U.S. economy. In discussing the downturn, Federal Reserve Board Governor Laurence H. Meyer explained how the recent period of technological innovation has created a vibrant economy in which opportunities for new jobs and businesses blossomed; and while challenges clearly exist, dramatic gains in innovation and technical change have driven productivity.[13] These gains are, in Greenspan's words, "structural gains in productivity,"[14] and as government after government has attested, the fuel for the technology-based productivity engine is a growing, highly trained, ICT-enabled workforce.

The direct line between the need to support a dynamic, expanding economy through the investment in and integration of ICT in public education has been both simple and quick for nations and communities to draw- and the consequences for failure to act in lost opportunity and unfilled jobs has been easy to track. ITAA's 2001 report, *Bridging the Gap*, found a job market where one in every 14 U.S. workers was involved in information technology and where one in every 12 IT jobs went unfilled for want of an appropriately skilled applicant.[15] In Singapore, Yeo Cheow Tong noted that

> "...with the rapid emergence of the Net Economy... the industry has projected that it will need 250,000 workers by the 2010. This is more than two-and-one-half times the current infocomm manpower of 93,000 that is being employed across all industries. This projection may appear on the conservative side, since International Data Corporation [IDC] has predicted that the global Internet economy will grow by 56% per year for the next 3 years."[16]

IDC Research reported a projected shortage of 1,000,000 IT professionals for Europe by 2002, threatening European growth and economic competitiveness. The marketing research firm also projected a worldwide deficit for the same year of 2,000,000 IT workers.[17] Additionally, the European Information Technology Observatory (EITO), noted that while the worldwide IT industry creates about 600,000 jobs a year, more than 100,000 additional jobs could be created if industry could find sufficiently skilled people.[18]

Thus, a global competition has emerged, driven by the quest for economic advantage that revolves around a race to improve the development of a knowledgeable, skilled workforce. We now see politicians running for office to be the Education President or, as in the case of Tony Blair, on a platform of education, education, education. We now see marketing tracking agencies such as the Computer Industry Almanac and QED following the rate of computer and Internet penetration into the population, and governmental agencies such as the USDOE's National Center For Education Statistics and the U.K.'s Department for Education and Employment measuring the ratio of students to internet-enabled, multi-media computers. Of the 100 cases documented in APPENDIX A, not one failed to indicate at some point in discussions, proposals, policy documents or program initiatives the crucial role of ICT in education to enable the development of a skilled workforce for growing a competitive 21st century economy. The competition is palpable, as Ralph Tabberer of the U.K.'s Teacher Training Agency indicated when he saw a

[12] *Draft New Basics Technical Paper*, Version 3, 3 April 2000, pp 5-6; APPENDIX A, #68
[13] *What Happened to the New Economy?* Remarks by Laurence H. Meyer before the New York Association for Business Economics and The Downtown Economists, New York, June 6, 2001.
[14] Greenspan, June 13, 2000
[15] http://cnnfn.cnn.com/2000/04/20/career/q_it_shortage/
[16] Yeo Cheow Tong, March 4, 2000
[17] http://www.nua.ie/surveys/index.cgi?f=VS&art_id=905355296&rel=true, September 23, 1999
[18] http://www.iht.com/IHT/SUP/052799/car03.html, May 27, 1999

comparison of his country's Internet penetration to that of other nations. "The U.K. is twelfth?" he said. "We're going to change that!"[19] It is this reality that has driven a common pattern of response to ICT integration and education transformation in various regions of the world.

**The Commonalities**

Prior to the spectacular growth of the World Wide Web in 1994, the introduction of computers into schools was considered desirable, but hardly imperative. The purposes for hardware purchases ranged from making new tools like word processors available to providing interesting instructional support materials for specific educational objectives to introducing computer literacy and even programming concepts to simply being innovative. Little urgency existed to drive investments, and decisions to buy were essentially discretionary and even adventuresome. Training for teachers was generally focused on using the technology, and included matters such as file management and disk handling. While differences could be found from implementation to implementation, and models for effective integration had evolved,[20] the use of computers in teaching and learning had little institutional impact during that period. As a result, local conditions predominantly determined the approach to and perceived value of technology in education. Such was the circumstance that caused one early provider of educational hardware and software in 1991 to conclude that, after on-site investigations, solutions created in the U.S. could not be successfully remarketed in Europe or even in Canada.[21] But then, the marriage of information technology and communications technology had not yet occurred, and the global digital economy had not yet been born.

Just seven years after the initial release of the first commercial graphical Web browser, the urgency of investment in ICT is now virtually universally accepted. The OECD is engaged in various studies on the role of technology in education for spurring community development among its 30 member nations,[22] and there is even a guide now available from Harvard's Center for International Development, replete with exemplars from countries such as India, Chile, Peru and Tanzania, to help developing nations plan for establishing and using the productive capacities of technology.[23] Inquiries about the use of computers in classrooms come by e-mail from all parts of the world, including requests from India's SchoolNet project and queries from Nigeria about reading using computers.[24] One of the Reinventing Education projects is focused on integrating computer-based instructional programs into classroom practice in Viet Nam using the same content and methods employed in many school districts in the U.S.[25]

The similarities in focus and attention relative to the implementation of ICT in education that have emerged are striking, and have moved far beyond the early days of buying computers and providing technology training. These commonalities lie in three main areas: infrastructure, professional training, and a drive for improved results.

## Infrastructure

The U.S. Congress established the e-rate in 1996 to enable schools, and particularly the poorest schools, to get online. At roughly $6 billion expended exclusively on communications networking by the end of 2000,[26] this investment is clearly one of the most (if not the most) impressive in the world. It is not the only example, however, of key investments to foster ICT in schools. The U.K.'s National Grid for Learning (NGfL), for instance is funded at a more modest level of $1.6 billion over four years, and includes support for Internet-based teaching and learning and the

[19] APPENDIX A, #20
[20] http://www.apple.com/education/k12/leadership/acot/library.html
[21] Personal communication with Robert W. Mendenhall, President, WICAT Systems, May 14, 1991
[22] APPENDIX A, #2; see http://www.oecd.org/els/education for current reports.
[23] http://www.readinessguide.org/vignettes.html
[24] Personal e-mails from Louise Davis, 8/10/200 and Esat Feria, 2/6/01
[25] APPENDIX B, #72
[26] http://www.benton.org/e-rate/pressrelease.html,

management of education, and actually establishes a national education network.[27] In fact, many nations have built ICT networks for schools. Twenty-three nations in Europe, including, among others, the U.K., Ireland, France, Slovenia, Israel, Greece and Portugal have formed a network alliance called EUN Schoolnet, termed by the EUN as a network of networks, and funded by the member Ministers of Education and the European Commission. EUN Schoolnet itself provides significant multi-lingual resources and activities in support of pan-European ICT integration and use in schools.[28] Australia has a similar network, EdNA that is owned mutually by all the Ministers of Education and Training from the states and territories.[29] Singapore, through its Masterplan for IT, the Ministry of Education Web sites, and Sing ONE, a national broadband network, provides broad support for the development of ICT at all levels of education.[30] Japan's investments include the Advanced National Education Network linking 2000 schools in all 44 prefectures and an increasing focus on broadband networks.[31] Differences in approach from network to network exist, but all represent funded policy initiatives and are focused on creating linkages and resources to facilitate ICT-based education.

### Professional Development

In 1999, the CEO Forum published its Year 2 report on Professional Development for integrating technology with teaching and learning.[32] In that report, the CEO Forum made two key points that have profound implications for training teachers to use ICT effectively:

1. Training teachers on the basics of technology is insufficient to develop effective models of technology integration in classrooms,[33] and

2. Training for effective technology integration is a continuous improvement process best focused on results.[34]

Since the publication of that report, the federal PT3 (Preparing Tomorrow's Teachers to Use Technology) program was funded at $75 million in 2000, and, with many other state, local and federal investments, drove the total expenditures as a percentage of the nation's technology expenditures in schools to nearly 20%. Again, though the magnitude of investment by the U.S. is large, other nations are also investing significantly in the same endeavors. In the U.K., for instance, $363 million in New Opportunities Funds (NOF) are dedicated to training teachers to use technology in their specific areas of curricular expertise to meet the requirements of the National Curriculum. Every one of the national networks listed above has a professional development component, and in some instances such as Singapore's Teachers' Network, Germany's e-initiative.nrw, and Denmark's Sektornet, the teacher focus is primary.[35]

Another powerful indicator of common interest in effectiveness-driven, classroom integration-oriented professional development is the focus seen in all of the Reinventing Education projects. Even the Viet Namese project referenced earlier, though categorized by both IBM and the Ministry as a content project, has a focused teacher training component involving Hanoi Teacher Training College.[36] Similarly, the project in the State of Rio, though dealing with the need to improve science instruction, is an ICT-based professional development program employing online

[27] APPENDIX A, #11, 4/19/99, 5/24/99
[28] APPENDIX A, #3; http://www.eun.org/eun.org2/eun/en/about/sub_area.cfm?sa=87
[29] APPENDIX A, #69, 8/23/00; http://www.edna.edu.au/EdNA
[30] APPENDIX A, #57, http://www.s-one.gov.sg/overview/it2k01.html; http://www1.moe.edu.sg
[31] APPENDIX A, #66 and #67
[32] *Professional Development: A Link to Better Learning*. CEO Forum, http://www.ceoforum.org
[33] *Ibid.*, STaR Chart
[34] *Ibid.*, pp. 12-15
[35] APPENDIX A, #63, #55, #46
[36] APPENDIX B, #72

collaboration tools.[37] Ireland, Italy and Mexico are all engaged in using online collaboration tools to prepare teachers to use ICT more effectively,[38] while Singapore is using similar tools to explore transformations of conventional practice in their schools by introducing new methods of teaching and assessing student performance using ICT.[39] Overwhelmingly, education policy makers around the world have come to understand that realizing the potential benefits of ICT investments is wholly dependent on the preparation of teachers to carry out effectively new models of instruction.

### The Drive for Improved Results

One problem with revolutions, whether political or economic, is that they often require action before all matters can be fully considered. And while *carpe diem!* may make a terrific motto, it may not be the best method of public policy formation. On the other hand, if shots are flying and bombs are bursting, asking to think things through for a few years probably won't bring about a cease-fire. There can be little doubt that much of the pressure to place computers in classrooms, build communications infrastructure and education networks, and train teachers in using the new tools came from the burgeoning new economy and the urgency to address the implications within educational institutions in time to meet new demands before windows of opportunity closed. And though the investments in ICT for schools were made with clear strategic vision, it doesn't mean that the implications were always understood or the details of implementation were always worked out.

Two Reinventing Education cases have been concerned about the implications of this for some time. Victoria, Australia, has a long history of excellence in the use of ICT in schools. It is noteworthy that while recent information out of the National Center for Educational Statistics in the U.S. reports roughly 2/3 of U.S. teachers feel at best only somewhat prepared to integrate technology into classroom instruction,[40] 2/3 of Victoria's teachers report "routine use" of ICT in their classroom activity.[41] Yet Victoria is still investing in a Reinventing Education project to study, through action research, effective practices with ICT to build a cadre of sharable expertise within Victoria's schools to enable broader dissemination of those practices.[42] The Standards and Effectiveness Unit in the U.K. was originally formed early in Tony Blair's first administration to focus on improving standards of performance in the U.K. through the identification and dissemination of demonstrated effective practice.[43] One of the key programs developed for accomplishing this purpose is called the Beacon Schools program. The U.K.'s Reinventing Education project focuses on the dissemination aspects of the Beacon Schools program, seeking to use ICT as a means of defining and facilitating methods of disseminating effective practice.[44] It is interesting to note that the relatively recent focus in the U.S. on accountability has focused more on funding conventional objectives measurement than on research and dissemination of effective practices.

## Conclusion

The urgency to introduce ICT into classrooms around the world has stemmed from fundamental transformations in the economic and social context in which schools exist. This is as it should be, as schools serve the societies that create them. If there is an increasing consistency in how nations approach the issues of integrating technology into their schools, it is perhaps because of the increasing similarity of social and economic structures in which all our schools exist.

[37] APPENDIX B, #75
[38] APPENDIX B, #73, #76, #78
[39] APPENDIX B, #77
[40] "Teacher Use of Computers and the Internet," USDOE National Center for Educational Statistics, April, 2000
[41] APPENDIX A, #69, 8/23/00
[42] APPENDIX B, #79
[43] APPENDIX A, #8
[44] APPENDIX A, #74

The speed with which these events have unfolded, however, leaves questions unanswered. Some of these have already been asked: Do we know what practices are effective? Do we know how to train our teachers so they can implement these practices? But beyond those questions lie some others that must be asked and answered: Do we know yet what changes our economy and society demand our curriculum and instructional practices to address? If there is a new, 21st century global digital economy, do we understand enough of its requirements to determine what schools must do differently from what they have done conventionally? As we search for effective practices and study ways to transmit what we've learned, are we trying to fit truly different kinds of goals, means and results into institutions formed to support other goals, means and results? Have we begun the process of understanding what our institutions need to become?

The introduction of ICT has in a mere seven years become a fundamental component of contemporary education. What it has not yet become is part of a construct of transformed public educational institutions. What we have discovered is that the implications of the 21st century global digital economy and the presence of ICT in our educational institutions has begun a dramatic process of change, not the least of which is that those exploring the possibilities are far more numerous and far more advanced than we may have thought. What we have not yet discovered is what we want to accomplish with ICT. What is not sufficient is to do the same things we've always done a little faster and a little better; the changes already in place tell us that such an ambition is too meager.

# APPENDIX A: Meetings and Informants List

Type refers to Business Meeting, Presentation, or Reinventing Education Grant activity.

## Multinational

| Meeting/Group | Key Informant(s) | Dates | Type |
|---|---|---|---|
| BETT (British Education Training and Technology) Show | Multiple | 1/13-1/15/99; 1/12-1/14/00; 1/10-1/13/01 | P, B<br>B<br>B |
| OECD (Organisation for Economic Co-operation and Development) | David Istance, Principal Administrator, Centre for Educational Research and Innovation | 7/5/99 | B |
| EUN Schoolnet | Ulf Lunden, Director<br>Ferry de Rijke, Chairman | 1/11/00;<br>4/11/01 | B<br>B |
| EUN Schoolnet Conference | Ulf Lunden, Director | 3/20-3/21/00 | P |
| EU e-learning Summit | Multiple | 12/7/00;<br>1/12/01<br>5/10/01 | B<br>B<br>P |

## England

| | | | |
|---|---|---|---|
| Business in the Community | Estelle Morris, Minister for School Standards | 2/16/99 | B |
| Lincolnshire Technical College | | 2/19/99 | B |
| SEU (Standards and Effectiveness Unit), DfEE (Department for Education and Employment, now DfES, Department for Education and Skills) | Michael Barber, Director<br>Ralph Tabberer, Senior Adviser | 2/23/99 | B |
| Birmingham LEA (Local Education Authority) | Doug Brown, IT Adviser and International Liaison | 4/14/99 | B |
| Staffordshire LEA | | 4/15/99 | B |
| NGfL (National Grid for Learning), DfEE | Ralph Tabberer, Divisional Manager | 4/19/99,<br>5/24/99,<br>6/29/99, 10/14/99 | B<br>G<br>G<br>G |

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|---|---|---|---|
| Reinventing Education Project | Ralph Tabberer, Chief Executive, TTA<br><br>Keith Andrews, Manager, Beacon Schools, DfEE | 3/22/00,<br>9/29/00,<br>6/13/01;<br>staff meetings 2000-present | B<br>B<br>B<br>G |
| Essex County LEA | Peter Evans, Head of Education Services | 4/21/99,<br>5/21/99 | B<br>B |
| BESA (British Educational Software Assn.) | Eileen Devonshire, | 4/21/99,<br>6/29/00 | B<br>B |
| TWL (Tomorrow's World Live) Project meetings | | 4/20/99-6/27/99 multiple staff meetings | B |
| TWL Expo | | 6/28-7/4/99 | B |
| NAHT (National Head Teachers' Association) | Chris Thatcher, President | 5/24/99,<br>7/1/99,<br>9/15/99 | B<br>B<br>B |
| BECTa (British Educational Communications and Technology agency) | Owen Lynch, Chief Executive; Fred Daly, Director, NGfL | 6/14/99 | B |
| Greenwich LEA | | 9/15/99, 11/15/99, 1/11/00 | B<br>B<br>B |
| Skinners Conference | | 10/14/99 | P |
| NAHT Conference | Chris Thatcher, President | 10/15/99 | P |
| DfEE | Michael Wills, Minister for Learning and Technology | 11/17/99 | B |
| DfEE, Curriculum and Communications Group | Imogen Wilde, Director of the Schools Directorate, DfEE | 1/21/00;<br>1/8/01 | B<br>B |
| TCT (Technology College Trust) | Professor Nigel Paine, Chief Executive | 3/15/00 | B |
| Institute of London, Department of Education | Professor Geoff Whitty, Director | 3/16/00,<br>1/8/01 | B<br>B |
| West Sussex Council | | 5/15/00 | B |
| NAACE (National Association of Advisers for Computers in Education) Conference | Mike Smith, Professional Officer | 5/16/00 | P |
| TCT Conference | Professor Nigel Paine, Chief Executive | 11/30/00 | P |
| New Invention Infant School | | 12/4/00 | G |
| Brychall Secondary School | | 12/4/00 | G |
| NCSL (National College for School Leadership) Online | Tony Richardson, Head | 12/7/00 | B |

## Scotland

| | | | |
|---|---|---|---|
| Inverclyde Council | Maria Russell, Director, Information Technology Services | 2/17/99,<br>4/16/00 | B<br>B |
| Inverclyde Schools Head Teachers | Robert Cleary, Chief Executive, Inverclyde Council | 4/16/00 | P |
| SCET (Scottish Council for Education Technology) | Ian Watson, Managing Director;<br>Richard Pietrasik, Chief Executive | 5/28/99<br>7/4/99 | P<br>B |
| SESNET (Napier University) | Henry McLeish, Minister of Enterprise & Lifelong Learning | 10/13/99 | B |
| Glasgow Telecolleges Network | Tom Wilson, Principal | 5/28/99, 11/19/99 | B<br>B |
| Scottish Executive | John Elvidge, Secretary and Head, Education Department; | 4/16/99 | B |
| Scottish Executive, ICT Team | Stuart Robertson, Team Leader | 4/16/99, 11/19/99, 1/13/00 | B<br>B<br>B |
| Clackmanonshire LEA | | 1/17/00 | B |
| CBI Mentoring Project | | 3/23/00 | B |
| British Association for Learning English for Academic Purposes (BALEAP) Conference | | 4/10/01 | P |
| Edinburgh International Science Festival | | 4/12/01 | P |

## N. Ireland

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|---|---|---|---|
| WELB (Western Education Library Board) Classroom2000 | Jimmy Stewart, Director | 6/12/01 | B |

## Ireland

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|---|---|---|---|
| Reinventing Education Grant Project | | | G |

## Norway

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|---|---|---|---|
| Haram-modellen Schools | Arild Eiken, Project Leader | 9/8/99 | B |

## Denmark

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|---|---|---|---|
| Uni-C | Dorte Olesen, CEO | 9/9/99 | B |
| City of Naestved | Hermann Weidemann, Local Authority Director | 9/99/99 | B |
| City of Aarhus | Poul Tang, Sektornet Support | 2/24/00 | B |

## France

| | | | |
|---|---|---|---|
| Ministry of Education | Pascal Colombani, Director of Technology; Clara Danon, Director of New Technologies | 2/22/00,<br>7/5/99 | B<br>G |
| Toulouse IUFM and Academie | Gilbert Ducos, Director, Formation Unit | 5/25/99 | G |
| Toulouse ZEP Schools Project | | 1/12/00, 12/31/00<br>various remote meetings | G<br>G |

## Germany

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|---|---|---|---|
| Berlin Senate Administration for Schools, Youth and Sport | Dr. Thoma, Media Consultant | 3/13/00 | G |
| Berlin Waldenburg-Oberschule | Herr Schwiewek, Headmaster | 3/13/00 | G |
| Reinventing Education Project Discussions | Herr Roland Berger, Director, e-initiative.nrw; Frau Dr. Susanne Pacher, Adviser, Baden-Wuerttemberg Ministry of Culture, Youth and Sport | 5/19/00 | G |
| Reinventing Education Discussions, Ministry for Schools and Further Training, Science and Research, North-Rhine Wesphalia | Paul Eschbach, Section Chief; Roland Berger, Director e-initiative.nrw | 9/27/00,<br>1/11/01 | G<br>G |

## Italy

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|---|---|---|---|
| Reinventing Education Project | | | G |

## Singapore

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|---|---|---|---|
| Reinventing Education Discussions with MOE | Betsy Lim, Director of IT Training | 1998-1999, multiple meetings | G |
| Outram School | Chan Poh Meng, Principal | 8/28/99 | B |
| Raffles Girls' School | | 8/30/99 | B |



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| Nanyang Girls High | Goh Kin Soon, Head of Department, IT | 8/30/99 | B |
| MOE | Wee Heng Tin, Director-General of Education; Tan Yap Kwang, Director Educational Technology Division; Betsy Lim | 8/26/99,<br>9/2/99,<br>4/2/01 | G<br>G<br>G |
| Schools' Administrators Plenary | | 9/2/99 | P |
| Teacher's Network | Nicholas Tang, Deputy Director | 8/28/00 | B |
| Outram School/MOE Reinventing Education Project | Chan Poh Meng, Betsy Lim | 3/7-3/11/00;<br>8/25/00;<br>3/30-4/2/01 | G |

## Vietnam

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|---|---|---|---|
| Reinventing Education Project | | | G |

## Japan

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|---|---|---|---|
| Mitaka City Education Center | | 8/29/00 | B |
| Reinventing Education Discussions | Katumi Oshima, Chief Researcher and Teacher-Consultant to Mitaka City Board of Education | 8/31/00 | G |

## Australia

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|---|---|---|---|
| Department of Queensland Education | W.G. (Bill) Clarke, Director, Information Management | 8/22/00 | B |
| Victoria Department of Education and Employment Training | Nicky Capponi, Manager, Centre for Technology Supported Learning | 8/23/00,<br>3/28-3/29/01 | G<br>G |

## Mexico

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| Reinventing Education Project | | | G |

## Brazil

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| Reinventing Education Project | | | G |

TOTALS:

| BUSINESS | PRESENTATION | GRANT |
|---|---|---|
| 62 | 10 | 28 |

# APPENDIX B: IBM Reinventing Education Program

## International Grant Site Overviews

### Strengthening Curriculum

*VIETNAM MINISTRY OF EDUCATION*

**Challenge:** To improve the quality of instruction by providing teachers with hands-on professional development opportunities, with a focus on technology.

**Technology Solution:** Teaching and Learning with Computers

**Current Implementation:**

- Number of Schools: One primary school (Tran Quoc Toan), 4 secondary schools (Trung Nhi, Nguyen Truong To, Hanoi-Amsterdam and Chu Van An), and the Hanoi Teacher Training College (Truong Cao Dang Su Pham Ha Noi)
- Number of Teachers: 60 teachers

**Project Description:** The Vietnam Ministry of Education/IBM Reinventing Education grant partnership is focused on teacher professional development in the use of technology. Beginning in Hanoi, teachers are exploring and learning new ways of teaching and learning in order to improve students' performance using IBM's ***Teaching and Learning with Computers*** (TLC) approach, which emphasizes integrating technology into school curricula and student-centered classes. The partnership involves the Hanoi Teacher Training College, the major teacher training institution that has incorporated technology into its ongoing preservice program.

**Next Steps:** The partnership, through the Hanoi Teacher Training College, will continue to train greater numbers of teachers throughout Hanoi, beginning in Ho Chi Minh city.

### Increasing Collaboration for Higher Achievement

*IRELAND DEPARTMENT OF EDUCATION AND SCIENCE*

**Challenge:** To bridge the gap between home, school and community by providing parents with secure, online opportunities to participate in their children's education.

**Technology Solution:** IBM Learning Village

**Current Implementation:**

- Areas of the country: Dublin, Cork and Dundalk
- Number of Teachers: 450

**Project Description:** Through Reinventing Education, a localised version of ***IBM Learning Village*** is being implemented in three areas of the country: Dublin, Cork and Dundalk. Teachers are using the technology to collaborate with teachers in other schools on subjects of common interest such as best practices in science teaching. Using IBM Learning Village, teachers also have created their own homepages that parents are accessing for information on classroom activities. Parents are using the technology to communicate with teachers about their children's progress. The National Center for Technology and Education, a primary partner in this project, has developed training and materials for teachers on IBM Learning Village and is providing ongoing support.

**Next Steps:** Project scale-up will begin in Dundalk to introduce the project to all schools in the town.

*UNITED KINGDOM DEPARTMENT FOR EDUCATION AND EMPLOYMENT*
**Challenge:** To develop models for the effective dissemination and sharing of successful practices where a significant aspect of the sharing is online.

**Technology Solution:** IBM Learning Village

**Current Implementation:**

- Number of Schools: 50 schools (25 Beacon schools and their 25 partner schools)

**Project Description:** Through Reinventing Education, ***IBM Learning Village*** is being customized to support the Department for Education and Employment's efforts to raise academic standards through the dissemination of successful practices. Specifically, the technology is being implemented both in the Beacon schools, a network of the United Kingdom's best performing schools that are engaging in a range of activities to share effective practices, and in the Beacon's partner schools, which have joined the partnership to help create models of effective dissemination and practice. Using the technology's online communications tools, teachers within the Beacon and partner schools are collaborating with one another to share best practices and, most importantly, to identify and spread the critical components of effective systemic change in a school—beyond individual lessons, projects, and special initiatives.

**Next Steps:** As part of the development of the models, the partnership is determining how IBM Learning Village can interface with the Department for Education and Employment's Standards Website, so that educators can take advantage of the Website's standards repository along with the powerful IBM Learning Village collaboration tools.

## Improving Teaching

*STATE OF RIO DE JANEIRO, BRAZIL DEPARTMENT OF EDUCATION*
**Challenge:** To improve the quality of teaching, with a focus on the sciences.

**Technology Solution:** IBM Learning Village

**Current Implementation:**

- Teachers trained: 700

**Project Description:** The Reinventing Education grant project in the State of Rio de Janeiro, Brazil is using ***IBM Learning Village*** to support the professional development of teachers of biology, physics and chemistry—academic areas where there are a lack of teachers. Following a similar professional development model as in other international Reinventing Education sites, teachers participate in hands-on training and share teaching and learning experiences; IBM Learning Village is being implemented to provide teachers with the ability to communicate online for ongoing support and guidance. Seven-hundred, of the approximately 1,200, science teachers in the Rio metropolitan area have been trained on IBM Learning Village at four sites, located in both the city and outer areas to be accessible to all teachers.

**Next Steps:** In 2002, the project will expand to include mathematics and language arts teachers, with the goal of reaching an additional 5,000 teachers.

*ITALY MINISTRY OF EDUCATION*
**Challenge**: To improve the quality of teaching by providing teachers with hands-on learning experiences and follow-up support and guidance.

**Technology Solution**: IBM Learning Village

**Current Implementation**:

- District Sites: Benevento, Crema, and Pontedera
- Number of Schools: 9 (Each site has 3: one elementary, one middle, and one high)

**Project Description**: The Italy/IBM Reinventing Education project is focused on using ***IBM Learning Village*** as part of the Italian Ministry of Education's comprehensive plan for the development of technologies that enhance teaching and learning. The technology solution is the basis of a comprehensive teacher professional development model, which combines hands-on training with online support and follow-up. IBM Learning Village has been translated and customized to meet the needs of the Italian school system, with the support of the local teachers and administrators and the IBM teams in Italy and Hursley, UK. It has now been implemented in three district sites in different geographic areas (from North to South): Benevento, Crema, and Pontedera. In the first site, Benevento, the school district is working with IBM to design and implement a Didactic Service Center to support this initiative for all of its schools.

**Next Steps**: The partnership is now expanding the number of schools in each site. Because the Ministry of Education believes that this model is perfectly consistent with its overall strategy, it is encouraging the development of new projects using the IBM Learning Village technology.

*SINGAPORE MINISTRY OF EDUCATION*
**Challenge**: To facilitate the movement from lecture-based to student project-based instruction through the introduction of new assessment and instructional strategies.

**Technology Solution**: Authentic Assessment Tool and IBM Learning Village

**Current Implementation**:

- School: Outram Secondary School
- Number of Teachers: 70

**Project Description**: The Singapore/IBM Reinventing Education project is implementing the ***Authentic Assessment Tool*** and ***IBM Learning Village's*** additional functions as the country begins to challenge their traditional instructional and assessment practices, shifting from a lecture-based approach directed by teachers to a student project-based approach. One major focus of the partnership is to establish standards for creating and assessing project-based lessons, in line with the Ministry of Education's long-term goal of setting and using standards for better teaching, learning and assessment. As part of outreach efforts, presentations and professional development activities throughout Singapore and the Southeast Asia Region are under way, with Outram Secondary School serving as a model for replication.

**Next Steps**: As the partnership comes to a formal end this year, plans are being developed to continue to expand the project throughout Singapore, as well as the Southeast Asia Region.

*MEXICO Instituto Tecnologico de Estudios Superiores de Monterrey*
**Challenge**: To improve the quality of instruction by providing teachers with hands-on learning experiences and follow-up support and guidance, as well as online professional development opportunities.

**Technology Solution:** IBM Learning Village

**Current Implementation:**

- Number of Teachers: 25 lead faculty members, who have responsibility for training additional teachers and professors

**Project Description:** Since May 2000, the partnership has been implementing ***IBM Learning Village*** at the Instituto Tecnologico de Estudios Superiores de Monterrey (ITESM, also known as Monterrey Tech) to improve teacher training for elementary and secondary schools. The technology, which has been customized for the Spanish language, is facilitating both off- and online teacher professional development by providing an integrated set of communication and collaboration tools that overcome barriers associated with distance, time, and cost. IBM Learning Village will complement Monterrey Tech's current teacher training efforts, including Tec.com—their new distance learning program, as well as a major training program for elementary and secondary school teachers.

**Next Steps:** The partnership will complete the development of an online teacher training course that uses IBM Learning Village's Instructional Planner. The partnership also plans to expand the number of teachers involved in the project and to bring the Mexico Ministry of Education into the partnership to aid in the scale-up of the technology to more teachers.

*VICTORIAN DEPARTMENT OF EDUCATION, EMPLOYMENT AND TRAINING*
**Challenge:** To improve the quality of instruction by providing teachers with hands-on learning experiences and follow-up support and guidance.

**Technology Solution:** IBM Learning Village

**Planned Implementation for Pilot Stage:**

- Number of Teachers: 12 teachers from 6 different schools

**Project Description:** The partnership, launched in March 2001, will implement ***IBM Learning Village*** to enhance teacher professional development opportunities and student learning, particularly in the elementary and middle years. Specifically, the project will use IBM Learning Village's communication and collaboration tools to provide follow-up support for teachers participating in hands-on training opportunities. The project also will use IBM Learning Village's Instructional Planner to create standards-based lesson plans. Finally, the project will adapt the classroom-based teacher training models developed in San Jose, which focus on inquiry-based research projects that incorporate technology. To ensure successful expansion, the project is developing links with other Department initiatives, including the Successful Implementation of Learning Technologies (SILT), which is establishing baseline data about effective teaching and learning practices and is exploring mechanisms for facilitating teacher adaptation of these practices.

**Next Steps:** The project will be incorporated into the Department's Learning Technologies Professional Development Program in Victoria. The network of teachers and schools will expand progressively to 70-100 teachers in 24-36 schools over the period of the project, and in the ensuing years, these teachers will act as mentors, supporting the provide professional development of other teachers.

*U.S. Department of Education*
*Office of Educatonal Research and Improvement (OERI)*
*National Library of Education (NLE)*
*Educational Resources Information Center (ERIC)*

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